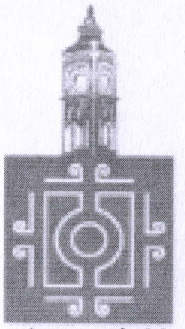

BENGALURU CITY UNIVERSITY

SYLLABUS For B.Sc SERICULTURE
(I & II Semester)

CHOICE BASED CREDIT SYSTEM

2020-2021

PROCEEDINGS OF THE MEETING OF THE BOARD OF STUDIES IN SERICULTURE (UG) FOR BENGALURU CENTRAL UNIVERSITY HELD ON 27th August 2018 at 11.00 AM IN THE CANARA BANK SCHOOL OF MANAGEMENT STUDIES, CENTRAL COLLEGE CAMPUS, BENGALURU – 560 001.

Members Present:

1. Dr.H.B. Manjunatha, Chairman
   Professor, Dept. of Sericulture Science
   University of Mysore ,
   Manasagangothri,
   Mysore-570 006.

2. Dr. Shivashankarappa L.H, Member
   Associate Professor,
   Department of Sericulture,
   Maharani Science College for Women,
   Palace Road, Bengaluru -560 001

3. Dr. Manjula A.C, Member
   Associate Professor,
   Department of Sericulture,
   Maharani Science College for Women,
   Palace Road, Bengaluru -560 001

4. Dr.. Francis C.R, Member
   Assistant Professor,
   Department of Sericulture,
   Maharani Science College for Women,
   Palace Road, Bengaluru -560 001

5. DrH.L. Ramesh, Member
   Lecturer in Sericulture,
   VV Puram Science college,
   K.R Road, Bangalore-4

6. Sri.G.S. Raju, Member
   Lecturer in Sericulture,
   VV Puram Science College,
   K.R Road, Bangalore-4

The Chairperson welcomed all the members and appraised the Agenda to the Board Members.

1) The Board approved the adoption of Syllabus and Regulations of Bangalore University for UG Sericulture course of Bengaluru Central University for the academic year 2018-19.

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BANGALORE UNIVERSITY

SERICULTURE SYLLABUS
UNDER
CHOICE BASED CREDIT SYSTEM

FIRST SEMESTER

PAPER – I : GENERAL SERICULTURE & MORICULTURE

OBJECTIVES: **52 Hours**

1) To introduce the concepts of origin & growth of sericulture & study sericulture as science.
2) To acquaint with general aspects of sericulture industry.
3) To understand the scientific approach of mulberry cultivation & production.

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UNIT – 1

1) Introduction to Sericulture – Definition, Origin & history – spread of sericulture – Distribution of sericulture in world – silk route — 2 hrs
2) Scope of sericulture science : Sericulture as an inter-disciplinary subject – science, social sciences, arts & management – Importance of sericulture in rural development & Indian economy – employment generation & role of women in sericulture — 2 hrs
3) Components of sericulture & silk industry : Mulberry cultivation – silkworm rearing –silkworm egg production – silk reeling & weaving – end products of each component & their economic importance. Sericulture – as an organised economic sector — 3 hrs
4) Global silk production: trends in silk production in China, Indian, Japan, South Korea, Russia, Brazil, Thailand – past & present. — 1 hr
5) Geographical concepts of tropical, temperate, sub – temperate/ tropical sericulture – Classification of countries – merits & demerits — 2 hrs
6) Types of silks : distribution of mulberry & non – mulberry silks in India, Food plants – primary & secondary – non-mulberry sericulture & tribal development – role of social forestry — 2 hrs
7) Sericultural practices in India: Concepts of traditional & non – traditional – meaning, traditional practices & areas – advantages & disadvantages. — 2 hrs

UNIT – 2

1) Study of soils : definition – process of soil formation – taxonomy of soils in brief 2 hrs
2) Soil properties : Soil profile – texture – textural class – structure – permeability – soil air – soil temperature – soil water fractions – soil moisture – water holding capacity – soil microorganisms Soil reaction: soil PH – acidity – alkalinity – characters of alkali soils & saline soils – remedial measures. 4 hrs
3) Modern system of plant classification in brief: Bentham & Hooker – binomial nomenclature – taxonomic terminologies – technical description of plant – floral biology – modern trends in taxonomy in brief. 3 hrs
4) Taxonomy of mulberry – popular cultivars in India. 2 hrs

UNIT – 3

1) Anatomy: Anatomy of root, stem & leaf of typical dicot & monocot secondary growth – anatomy of root – stem (primary & secondary) – leaf – petiole in mulberry. 2 hrs
2) Brief account of photosynthesis, types of carbon fixation in relation to productivity, brief account of photorespiration and its significance 2 hrs
3) Agroclimatic Zones of Karnataka, Agroclimatic factors suitable for mulberry cultivation in brief 2 hrs
4) Establishment of mulberry plantation: selection of land – topography – preparation of land; digging, ploughing – tilling – leveling – orientation & layout for irrigated & pit system (implement – machineries used) 2 hrs
5) Planting materials: procurement of planting material – preparation of planting material – cuttings – sapling – nursery bed preparation & maintenance – sapling raising – propagation of mulberry – grafting & layering – types. 3 hrs
6) Planting System : row system – pit system – spacing in planting – advantages & disadvantages – tree planting – block system, paired row system – recommended spacing under improved method of mulberry cultivation – significance of spacing – impact of spacing and leaf productivity. 2 hrs

UNIT – 4

1. Nutrients: brief account of essential macro and micro nutrients – organic manures, green manures & fertilizers: sources – types – time & method of application – foliar nutrition – technique & significance. Impact of foliar nutrients on leaf yield & chemical composition of leaf – biofertilizers types & importance - application methods & limitations – concepts of integrated nutrient management. 4 hrs

2. Irrigation: Methods of irrigation, water requirement for mulberry under different seasons – sources of irrigation – impact of over irrigation & under irrigation – fertigation – concept & significance. 5 hrs

3. Package of practices for irrigated & rainfed mulberry garden: planting systems – manorial & fertilizer schedule – recommended dosage, Irrigation – types – frequency, mulching practices – methods & significance – intercultivation & weeding, pruning – methods & significance – pruning methods in India with special reference to Karnataka – leaf harvesting methods – advantages & disadvantages – leaf transportation – storage of mulberry leaves – importance. 5 hrs

References:

1. Synthesized Science of Sericulture, By Yokoyama, Published by Central Silk Board – 1954.
2. Sericologia By Tanaka Y.Pub., C.S.B. – 1964.
3. Culture and Sericulture by Prof. S.R.Charshly.
4. Sericulture for Rural Development Edited by H.G.Hanumappa.
5. Handbook on silkworm Rearing, Fuji Publications, 1972.
6. The Development of Indian Silk, Sanjay Sinha, 1990.
7. Introduction to Silkworm Rearing, The Japan Silk Association, Inc. Tokyo, Japan.
8. Silk by H.T.Gaddum and Company Ltd., Macchs field, Chestrin.
9. Sericulture Manual – I (Mulberry Cultivation) – 1972.
10. Text book of Tropical Sericulture – 1975, Pub. By Japan Overseas Corporation Volunteers, Sibuya-ku, Tokyo, Japan.
11. Jaisawal P.L 1980. Hand book of agriculture, Indian Council of Agriculture Research, New Delhi.
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13. Krishna Moorthy H N 1975; Gibberellins and Plant growth; Wiley Eastern, New Delhi
14. The Nature and Properties of Soils (9th edition) N C Brady (Mac Millan Pub. Co. Inc., New York.)
15. Studies on Soils of India; S V Govinda Rajan and H G Gopala Rao (1970), Vikas Publ. House Pvt. Ltd., New Delhi / Bombay.
16. Boraiah G 1986; Mulberry cultivation; Lectures on Sericulture
17. Dandin et al. 1988; Bibliography on mulberry (1900-1984) CSR & TI, (Central Silk Board) Mysore.
18. A Shankar and H R Shiva Kumar 2000; Drip and fertigation to the mulberry Geethanjali Printers.
19. S.Shankar 1997; Principles of Agronomy. The Bangalore Printing and Publishing Company.
20. FAO manual 1987; Soil and Water conservation in semi – arid areas. Oxford IBH
21. S. Krishnaswami 1993; A practical guide to mulberry silk cocoon production in tropics.
22. Hisao Aruga 1994; Principles of Sericulture; Oxford IBH.
23. M C Devaiah et al., 1998; Advances in mulberry sericulture; CVG, Publications.

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SECOND SEMESTER

PAPER – II : SILKWORM BIOLOGY & REARING TECHNOLOGY

OBJECTIVES: **52 Hours**

1) To understand the classification and biology of silkworm *Bombyx mori*.
2) To acquaint with ecology and ethology of silkworm rearing.
3) To familiarize with improved technologies in silkworm rearing & its impact on cocoon productivity.

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UNIT – 1

1) General account and outline classification of animal kingdom; general characters and outline classification of class Insecta — 3 hrs
2) Detailed classification of sericigenous insects: characteristic features of order Lepidoptera, families *Bombycidae & Saturnidae* – economic importance of insects — 4 hrs
3) Classification of silkworms: based on origin & geographic distribution – based on voltinism & moultinism – based on cocoon colour – popular mulberry silkworm Varieties of India. — 4 hrs
4) Biology of silkworm *Bombyx mori*: Life cycle of *Bombyx mori* — 2 hrs

UNIT – 2

1) Morphology of egg, larva, pupa & moth. Metamorphosis : organ-inter-relationship in metamorphosis. — 4 hrs
2) Anatomy & physiology: anatomy & physiology of digestive, circulatory, Excretory, respiratory, nervous & reproductive system of silkworm B.mori, Structure & function of silk glands – brief account on secretion of silk. — 9 hrs

UNIT – 3 **12 hrs**

1) Mulberry silkworm rearing: rearing house: location, plan, orientation types. Model rearing house; ground plan, salient features & advantages. Rearing appliances & equipments – uses — 4 hrs
2) Disinfection: concept, definition & objectives – methods – fumigation, spraying. Disinfection: classification, formulation dosage calculation – effective disinfection – process & significance — 6 hrs
3) Selection of race / breed of silkworm & Procurement, transportation procedure — 2 hrs

UNIT – 4

1) Chawki Rearing: concept, objectives & principles 5 hrs

- Incubation methods – black boxing – significance – role of environmental conditions for incubation
- Preparation for brushing, brushing methods – advantages – disadvantages
- Methods of chawki rearing – optimum environmental conditions for chawki rearing
- Methods & frequency of feeding, bed cleaning & spacing – significance
- Co-operative chawki rearing – importance
- Commercial chawki centres' and their management

1) Late age silkworm rearing: 6 hrs

- Objectives & principles
- Methods of rearing adult silkworm
- Quality of feed, methods of feeding, frequency of feeding
- Bed cleaning & spacing – methods & significance
- Bed disinfectant: types & application methods – significance
- Care at moulting.

1) Spinning and mounting: 2 hrs

- Spinning behaviours of silkworm
- Environmental factors influencing spinning
- Types of mountages – reasons for defective cocoon formation

1) Cocoon harvesting: 1 hr

- Harvesting – sorting & transportation procedure
- Environment conditions & timing of transportation of cocoon – significance – Quality inspection and grading of cocoons.

References:

1) Manual on Sericulture; Food and Agriculture Organisation, Rome 1976
2) Appropriate Sericultural Techniques Ed. By M S Jolly, Director, CSR & TI, Mysore.
3) Handbook of Practical Sericulture, S R Ullal and M N Narasimhanna, CSB, Bangalore 1987
4) Text Book of Tropical Sericulture, Pub. Japan Overseas Corporation Volunteers, 1975.
5) Handbook on Silkwom Rearing, Agriculture & Technical Manual-1, Fuzi Pub. Co. Ltd., Japan 1972.
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7) New Technology of Silkworm Rearing: S.Krishnaswamy, Reprinted by CSB, Bangalore 1986
8) Improved method of rearing young age silkworm: S Krishnaswamy, Reprinted by CSB, Bangalore 1986
9) The Principles of Insect Physiology: V B Wigglesworth. Pub. By English Language Book Soc., Chapman & Hall 1972.
10) Principles of Insect Morphology: R E Snodgrass, Tata Mc Graw Hill Pub. Co. Ltd., Bombay, 1935
11) Insect Biology in the future, VBW 80, Ed by Michael Locke, David S Smith, Academic Press, 1980.
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13) An Introduction to Sericulture, Ganga G and J Sulochana Shetty – Oxford & IBH Pub. 1991
14) China Sericulture 1972, FAO, Rome.
15) Silkworm Rearing and Diseases of Silkworm, 1956 Ptd. By Director of Ptg., Stn. & Pub. Govt. Press, Bangalore.
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27/8/18

FIRST SEMESTER

PRACTICAL – I : GENERAL SERICULTURE & MORICULTURE

16 PRACTICALS

1)	Sericulture maps :		01
a)	World map & silk route		
b)	India mulberry & non-mulberry belts.		
1)	Preparation of Pie charts : different types of silk production in India		01
2)	Land area measurement – conversions & calculations		01
3)	Soil analysis: for pH & electrical conductivity		01
4)	Determination of water holding capacity of soils		01
5)	Farm Implements		01
6)	Technical description of mulberry	01	
7)	Anatomy of root, stem & leaf of mulberry	03	
8)	Mulberry propagation: nursery propagation – grafting & layering	02	
9)	Mulberry cultivation: all aspects in detail (field work)		03
10)	Common weeds of mulberry garden.	01	

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SECOND SEMESTER

PRACTICAL – II : SILKWORM BIOLOGY & REARING TECHNOLOGY

16 PRACTICALS

1) Life cycle of B.mori, morphology of egg, larva, pupa & adult

02

2) Dissection of digestive system, nervous system & silk gland of silkworm larva

03

3) Dissection of male & female reproductive system of silk moth

02

4) Model rearing house – ground plan & chawki rearing / late age rearing

01

5) Rearing appliances 02

6) Disinfection – formulation, disinfectants – types – formulation – calculation – 01
Methods of application

7) Silkworm races – morphological study of BV & MV cocoons

01

8) ***Silkworm rearing – brushing – methods 02
Chawki – rearing – late age rearing, feeding, bed cleaning, spacing moulting

9) Mounting & spinning – types of mountages 01

10) Cocoon harvesting and quality assessment 01

Note: ***Silkworm rearing – compulsory rearing & submission of report

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BENGALURU CENTRAL UNIVERSITY

Curriculum in Sericulture for B.Sc (UG) 2019-20

Theory

Semester	Paper	Title of the Paper	Total number of hours	Hours / week	Marks	Internal Assessment*	Total Marks
I	I	General Sericulture and Moriculture	52	04	70	30	100
II	II	Silkwork Biology and Rearing Technology	52	04	70	30	100
III	III	Mulberry and Silkwork Crop protection	52	04	70	30	100
IV	IV	Silkwork Seed Technology and VanyaSericulture	52	04	70	30	100
V	V	Cytogenetics and Breeding of Mulberry	40	03	70	30	100
V	VI	Cytogenetics and Breeding of Silkworm	40	03	70	30	100
VI	VII	Silk Technology	40	03	70	30	100
VI	VIII	Sericulture Extension, Economics and Enterprenurship	40	03	70	30	100

PRACTICAL

Semester	Paper	Title of the Paper	Total number of hours	Hours / week	Marks	Internal Assessment*	Total Marks
I	I	General Sericulture and Moriculture	45	03	35	15	50
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III	III	Mulberry and Silkwork Crop protection	45	03	35	15	50
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SERICULTURE UG credit system							
A) I/II/III/IV semester							
Subjects	**Paper**	**Hours/week**	**Duration of exam (hrs)**	**IA**	**Exam**	**Total**	**Credits**
Optional papers with 1 practicals of 1 credit each	1 Theory	1x4	3	1x30	1x70	1x100	2
	1 practical	1x3	3	1x15	1x35	1x50	1

A) V/VI semester							
Subjects	**Paper**	**Hours/week**	**Duration of exam (hrs)**	**IA**	**Exam**	**Total**	**Credits**
Optional papers with 1 practicals of 1 credit each	1 Theory	2x3	2x3	2x30	2x70	2x100	2+2=4
	2 practicals	2x3	2x3	2x15	2x35	2x50	2

Semester	Theory	Practical	Total credits/ semester
I/II/III/IV Semester	2	1	3
V/VI Semester	4	2	6

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